REMARKS

Applicants have amended claims 1-16, and have added claims 17-29. Thus, the pending claims are claims 1-29, of which claims 1 and 29 are in independent form.

Applicants have also amended the specification and abstract by way of a substitute specification, which is provided with this response.

Applicant asks that all claims be examined in view of the amendment to the claims.

Enclosed is a Enter $ amount check for excess claim fees and a Enter $ amount check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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Electrical Appliance Housing

TECHNICAL FIELD

This invention relates to ~~a housing, for example,~~ an electrical appliance housing ~~or other, as the case may be, watertight housing, with a housing body made from hard plastic, in which provision is made for an aperture to actuate a switch or the like in the interior of the housing body, said aperture being sealed by means of a membrane of soft plastic, and further provision is made for an actuating button on or in the membrane for actuating the switch~~.

BACKGROUND

Electric toothbrushes ~~or~~ and other small electrical appliances such as shaving apparatus, kitchen ~~machines~~appliances, and the like ~~usually~~ generally have a watertight housing in the interior ~~of~~ in which there are often switches~~,~~. ~~thus requiring~~In some cases, it may be desired that the actuating energy for such switches ~~to~~ be passed through the housing wall in a manner preventing the ingress of water. In a typical arrangement the switch ~~in question~~ or ~~the~~ other mechanism (e.g., a brake, ~~or~~ coupling, ~~or~~ valve, ~~or~~ transmission, etc.) to be actuated lies behind an aperture in the housing wall which is sealed by an elastic membrane. To ~~switch~~ acitvate the appliance, the user presses ~~with a~~(e.g., presses with his or her finger) on the membrane, thereby actuating the switch or other mechanism underneath. The membrane is generally made of a soft plastics material which is bonded to the hard plastics ~~material of the~~ housing wall~~, in particular~~. The membrane and the housing wall can be injection-molded by ~~the~~ a two-component injection method.

As a visual and tactile ~~pointer~~ indicator to the underlying switch, the membrane often has ~~an elevation~~a projection or some other three-dimensional structure on its outside surface. ~~However, a disadvantage of this construction is that~~In cases in which the three-dimensional structure is made of the same material as the membrane, the three-dimensional structure and the membrane generally ~~and thus has~~have the same color~~. This~~, which can impairs recognition of the three-dimensional structure.

For this reason, ~~provision was already made on~~some known appliances ~~to insert~~include a metal actuating button inserted in a hole passing ~~right~~ through the membrane. However, such an arrangement ~~has the~~can ~~disadvantage that water is allowed~~allow liquid (e.g., water) to pass through the hole into the interior of the housing. ~~The~~ Thus, water-tightness of the housing ~~is~~ may no longer be assured.

SUMMARY

The invention relates to electrical appliance housings. ~~It is therefore an object of the present invention to provide an improved electrical appliance housing of the kind initially referred to which avoids the disadvantages of the prior art and develops the latter further in advantageous manner. In particular~~In general, the electrical appliance housings include an actuating button that is ~~to be~~ connected to the membrane in such a way that water is prevented from penetrating through the housing wall.

~~This object is accomplished according to the invention by an electrical appliance housing in accordance with claim 1. Preferred embodiments of the invention are the subject matter of the dependent claims.~~

~~According to the present~~In one aspect of the invention, ~~the~~ an actuating button is fastened to a hard plastic base ~~of hard plastics material~~ that is bonded to ~~the material of the~~a membrane. The hard plastic base is hermetically connected to the membrane such that substantially no water can reach the interior of the housing., ~~with the~~The plastics materials of the base and the membrane ~~being preferably~~can be ~~related~~ compatible with each other ~~in order~~ to help ensure a firm bond between them. The actuating button can be made of any of various materials without having to give consideration to a suitable material pairing of the membrane and the actuating button ~~with a view to obtaining~~to obtain a tight connection to the membrane. The membrane can be injection-molded onto the hard plastic base in a two-component injection-molding process.

In ~~a further aspect of the invention~~certain embodiments, the base which supports the actuating button is connected by ~~means of~~ at least one elastic bar to the hard plastic housing body. ~~Preferably~~In some embodiments, the elastic bar is constructed to exhibit material homogeneity with the housing body and/or the base, and is formed in one integral piece ~~therewith~~with the housing body and/or the base. ~~In particular t~~The base, the at least one bar, and the housing body can, for example, be injection-molded in one integral piece from plastic, ~~for example,~~such as polypropylene or ABS. The elastic bar, which connects the base to the housing body, ~~not only makes~~can make it easier to position the base in the aperture ~~in~~ of the housing body when the elastic membrane is molded on. The elastic bar can also ~~supports~~support the membrane, which ~~is an advantage in particular~~can be particularly advantageous with extensive membranes which otherwise tend to form creases or be excessively yielding.

To obtain ~~absolute~~ water-tightness of the housing in the region of the actuating button, the base on which the actuating button sits ~~is~~ can be constructed to be free of through-holes. The actuating button can partially ~~penetrates~~penetrate the base ~~but not fully, with the result that there is~~ such that no aperture ~~extending~~extends all the way through the base, from the outside of the base to the inside of the base.

~~The~~ In addition to enclosing the circumferential surface of the base, the membrane may at least partially ~~enclose the base not only on its circumferential surface but basically could~~ cover~~, at least partly, also~~ the end faces of the base as if the base were ~~quasi~~-cast integrally with the membrane. ~~Preferably~~In some embodiments, however, at least the end face of the base facing the outer side of the housing is constructed to be free of any overlay by the membrane. ~~On the end face of the base facing the outer side of the housing provision is made in the~~The membrane ~~for~~ can include a recess which ~~amounts more or less to~~is substantially the same size as the end face ~~area~~ of the base facing the outer side of the housing. ~~According to a preferred aspect of the invention~~In some embodiments, the base penetrates the membrane from its outer side to its inner side~~, i.e.~~. In such embodiments, the end face of the base facing the inner side of the housing is also constructed such that it is not overlaid by the membrane.

The at least one elastic bar previously mentioned, which connects the base to the housing body~~, could basically~~ can be cast integrally with the membrane. ~~However, to~~To obtain an attractive appearance, the at least one elastic bar ~~does not~~can lie on the ~~outer side of the membrane. Preferably the bar lies on the~~ inner side of the membrane. This ~~is~~ configuration can be advantageous not only for ~~visual~~ aesthetic reasons but also to provides a support for the membrane when the latter is depressed (e.g., depressed with a finger~~-~~tip of the user).

For ~~its~~ good visual and tactile recognition, the actuating button ~~is~~ can be constructed to be raised relative to the membrane.

~~According to an embodiment of the invention~~In certain embodiments, the actuating button and the base are ~~preferably~~ separate components ~~and~~ that are joined together, which enables them to be made of different materials. ~~While~~ In some embodiments, the base is made ~~preferably~~ of the same material as the housing body~~,~~ ~~the~~ The actuating button can be made of any of various materials, such as metal, ceramic, glass, and/or plastic.

The actuating button and the base can be joined together in any of various ways. ~~According to a preferred embodiment of the invention~~In certain embodiments, the base has a blind-end bore receiving a shaft-shaped section of the actuating button. The shaft-shaped section can be press-fitted in, adhesively bonded to, or cast integrally with the blind-end bore. To help prevent the actuating button ~~or~~ (e.g., the shaft-shaped section of the actuating button) from detaching itself from the blind-end bore, at least one radial rib and/or bead can be provided on the shaft. Such a radial projection digs into the wall of the blind-end bore in the base, thereby decreasing (e.g., preventing) the possibility of detachment.

To obtain a durable connection between the actuating button and the base, it is also possible for the actuating button to be welded to the base.

~~In an alternative further aspect of the invention~~In some embodiments, the actuating button and the base can ~~also~~ be constructed to exhibit material homogeneity in one integral piece. In ~~this case~~such embodiments, the base can ~~simultaneously~~ forms the actuating button.

It is ~~important~~generally beneficial, in particular when the actuating button is subsequently joined to the base and projects outwardly beyond the latter, ~~for no dirt to be able to get~~ to prevent debris (e.g., dirt) from entering in between the membrane and the actuating button. Therefore, ~~provision is made in accordance with a preferred embodiment of the invention for~~in some embodiments, the membrane ~~to have~~includes an edge section that encloses the base and projects beyond the base towards the outer side of the appliance. ~~and which abuts~~ The edge section can abut with a precise fit ~~or preferably with~~(e.g., a press-fit) against an edge section of the actuating button. When the actuating button is joined to the base, the edge section of the membrane is deformed such that a press fit is obtained between the actuating button and the membrane. In order ~~for this pressure not to cause~~to prevent detachment of the membrane from the base as a result of this pressure, ~~it is preferable for~~ the base ~~to~~ can have a radial projection (e.g., a circumferential shoulder) on its end face facing the inside of the housing~~, preferably a circumferential shoulder~~ for seating engagement with the membrane. When the actuating button is then placed on the base from the outside, thereby causing the edge section of the membrane to be compressed, ~~then~~ the radial projection on the base absorbs the corresponding pressure exerted on the membrane. The membrane is, therefore, compressed between the radial shoulder of the base and the radially projecting edge of the actuating button.

The edge section of the membrane, which projects ~~to~~ toward the outside of the housing prior to mounting the actuating button, can form an annular collar which ~~with its end face~~ engages the underside of the actuating button with its end face.

Alternatively, the edge section of the membrane around the base may ~~also~~ form a boundary for a recess that is coaxial with and adjacent to the base and into which the actuating button ~~is~~ can be inserted with a precise fit. For snug seating of the actuating button on the membrane ~~also in this embodiment~~, the recess of the membrane as well as the underside of the actuating button can be shaped in a conical configuration~~,~~ ~~with~~ In certain embodiments, the recess ~~preferably having~~has a smaller cone angle than the cooperating underside of the actuating button section.

In order to obtain an improved support of the membrane in cases where an extensive membrane is used, at least one protruding membrane support member ~~in the form of~~, such as a wing, ~~or~~ a thin plate, or the like, can be fastened~~, preferably~~ (e.g., molded)~~,~~ onto the base and/or onto the at least one elastic bar. ~~As the result~~In some embodiments, the membrane is supported not only by the area of the elastic bar itself but also by the additional area provided by such a

protruding membrane support member. ~~Irrespective of the mechanical effect, such~~In certain embodiments, a protruding plate or the corresponding wing can also be molded onto the base or the membrane in order to achieve a special visual effect.

The base can also be connected by ~~means of plural~~multiple elastic bars to the edge of the housing aperture. This ~~also~~ can results in an improved support of the membrane.

~~Conveniently~~In some embodiments, the material of the membrane ~~is~~ can be conveniently bonded not only to the material of the base, which supports the actuating button, but also to the material of the housing body. The membrane ~~is~~ can, for example, be molded onto the edge of the corresponding housing aperture using the two-component injection-molding method.

~~Further objects, advantages, features and application possibilities of the present invention will become apparent from the subsequent description of preferred embodiments which are depicted in the Figures of the accompanying drawings. It will be appreciated that all the features described and/or depicted, whether individually or in any meaningful combination, constitute the subject-matter of the present invention, irrespective of their summarization in the claims or the back-references of the latter. In the drawings,~~Other features and advantages are in the specification, the drawings, and the claims.

DESCRIPTION OF DRAWINGS

FIG. 1 is a sectional view of the housing body of an electrical appliance housing, taken along the line A-A of FIG. 2, showing a fragment of the housing body with an aperture and a base disposed therein for fastening an actuating button~~;~~.

FIG. 2 is a top plan view of the housing body and the aperture of FIG. 1 provided therein~~;~~.

FIG. 3 is a sectional view of the housing body similar to FIG. 1, showing the housing aperture sealed ~~by means of~~with an elastic membrane and an actuating button prior to its fastening to the base in the housing aperture~~;~~.

FIG. 4 is a sectional view of the housing body similar to FIG. 3, showing the actuating button in joined condition ~~as joined;~~.

FIG. 5 is a sectional view, similar to FIGS. 1, 3 and 4, of an electrical appliance housing according to an alternative embodiment ~~of the invention~~, showing the actuating button being joined to the base arranged in the membrane ~~by means of~~using a sonotrode~~;~~.

FIG. 6 is a sectional view, similar to FIG. 3, of another ~~preferred~~ embodiment of an electrical appliance housing, showing a conical actuating button prior to being joined to the base arranged in the membrane.~~;~~

FIG. 7 is a sectional view, similar to FIG. 4, of still another ~~preferred~~ embodiment of an electrical appliance housing.~~;~~

FIG. 8 is sectional view, similar to FIG. 7, of yet another ~~preferred~~ embodiment of an electrical appliance housing.~~;~~

FIG. 9 is a sectional view, similar to FIGS. 3 and 6, of an electrical appliance housing according to a further ~~preferred~~ embodiment ~~of the invention~~, showing the actuating button prior to being joined by friction welding to the base arranged in the membrane~~, joining to the base being performed by friction welding;~~.

FIG. 10 is a sectional view of the electrical appliance housing of FIG. 9, showing the actuating button ~~in condition as~~ joined to the base.~~;~~

FIG. 11 is a sectional view, similar to the preceding Figures, of another ~~preferred~~ embodiment ~~of the invention~~, in which the actuating button is molded onto the base using ~~the~~ a two-component injection-molding process.~~;~~

FIG. 12 is a sectional view, similar to the preceding Figures, of an electrical appliance housing according to still another ~~preferred~~ embodiment ~~of the invention~~, in which the actuating button is constructed to exhibit material homogeneity with the base.~~;~~

FIG. 13 is a sectional view, similar to FIG. 1, of a housing body of an electrical appliance housing according to ~~a preferred~~an embodiment ~~of the invention~~, showing two bases for accommodating two actuating buttons in one housing aperture, the section being taken along the line B-B of FIG. 14.~~;~~

FIG. 14 is a top plan view of the housing body of FIG. 13.~~;~~

FIG. 15 is a sectional view, similar to FIGS. 1 and 13, of a housing body of an electrical appliance housing, in which a base for accommodating an actuating button in a housing aperture is integrally formed on the housing body by ~~means of~~ two elastic bars, the section being taken along the line C-C of FIG. 16.~~;~~

FIG. 16 is a top plan view of the housing body of FIG. 15.~~;~~

FIG. 17 is a top plan view, similar to FIG. 16, of a housing body according to another embodiment ~~of the invention~~, showing a plate-shaped membrane support member integrally formed on the base~~; and~~.

FIG. 18 is a top plan view, similar to FIGS. 16 and 17, of a housing body according to still another embodiment ~~of the invention~~, showing ~~plural~~ multiple membrane support members in the form of wings integrally formed on the base and bar in the housing aperture.

DETAILED DESCRIPTION

FIGS. 1 to 4 are fragmentary views of ~~the~~ a housing 1 of an electric toothbrush or a similar electrical appliance ~~comprising~~ including a housing body 2 made from a hard plastics material, such as polypropylene or ABS, and having in its wall 3 an aperture 4 which in the embodiment shown has an approximately rectangular circumference with radiused corners. It will be understood, of course, that the aperture 4 may also be shaped in other forms.

Extending from the edge of the aperture 4 into the aperture 4 is a thin bar 5 which is a part of the housing body 2. As FIG. 1 shows, the bar 5 is molded integrally with the wall 3. On its free end, the bar 5 supports a base 6 which is aligned roughly central to the aperture 4 and in the embodiment shown has an approximately cylindrical contour. On its end facing ~~the~~ an inner side 7 of the electrical appliance housing 1, the base 6 has a radially projecting shoulder 8 (~~cf.~~ FIG. 1).

The bar 5, which extends parallel to the plane of the aperture 4, lies approximately at the lower edge of the aperture 4 facing the inner side 7.

The housing body 2, including the bar 5 and the base 6, and the aperture 4 ~~are~~ can be manufactured ~~by means of~~ using injection molding techniques. In a second injection-molding operation, a membrane 9 ~~is~~ can be injected into the aperture 4. The membrane 9 can be molded over the bar 5 and around the base 6. As FIG. 3 shows, the membrane 9 has a ~~low elevation~~ projection 10 in the form of an annular collar extending circumferentially around the base 6. The membrane 9 ~~is~~ can be made of a soft plastic, such as TPE. During the injection-molding operation this soft plastic material forms a bond with the hard plastic material of the wall 3 of the housing body 2 and of the bar 5 and base 6 which are molded onto the housing body. The plastic materials of the housing body 2 including the bar 5 and the base 6 and the material of the membrane 9 are ~~related~~ compatible with each other, thus resulting in a firm bond. As FIG. 3 shows, the thickness of the membrane 9 is smaller than the thickness of the wall 3. The surface of the membrane 9 facing ~~the~~ an outer side 11 of the electrical appliance housing 1 lies lower than the level of the wall 3 of the housing body 2 surrounding the aperture 4. The housing body 2 thus has a slight depression in the region of the aperture 4 sealed by the membrane 9.

An actuating button 12 of roughly mushroom shape is fastened to the base 6. The actuating button 12 is comprised of a head 16 and a shaft-shaped neck 17 onto which a sharp-edged, radially projecting rib 18 is molded. The actuating button 12 can be made of any of various ~~metal~~ metals, such as steel, stainless steel, aluminum, and/or the like. ~~or,~~ ~~alternatively~~Alternatively or additionally, the actuating button 12 can be formed of any of various other materials, such as a ~~very~~ hard plastic, a ~~or~~ ceramic, and/or a glass. The surface of the actuating button 12 can be finished ~~by means of~~using any of various techniques, such as electroplating, anodic oxidation, etching, coating, dyeing, grinding, ~~or~~ blasting, and/or the like. Instead of ~~the~~ having only one rib 18, it is also possible for ~~plural~~ multiple ribs to be arranged axially in series on the shaft-shaped neck 17.

As FIGS. 3 and 4 show, the actuating button 12 ~~is~~ can be cold-pressed into a blind-end bore 19 constructed in the base 6~~,~~. As a result, the rib 18 ~~becoming~~ can become anchored ~~in the process~~ in the wall of the blind-end bore 19. Placing the actuating button 12 down onto the base 6 compresses the ~~elevation~~ projection 10 of the membrane 9 between the shoulder 8 of the base 6 and the head 16 of the actuating button 12. The resulting press-fit can help to ~~prevents~~ prevent dirt from getting in between the membrane 9 and the head 16 of the actuating button 12.

To make it easier to press the neck 17 into the blind-end bore 19, the actuating button 12 can be heated prior to being pressed in. ~~If~~ In embodiments in which the actuating head 12 is made of metal, ~~it~~ the actuating button 12 can be heated by induction in a high-frequency electric field.

Alternatively, it is also possible for the actuating button 12 to be pressed into the blind-end bore 19 of the base 6 ~~by means of~~using a sonotrode in the form of a ram 20 vibrating at ultrasonic frequency, as ~~is~~ shown in FIG. 5. The ultrasonic vibration ~~is~~ can be introduced into the actuating button 12, causing the hard plastic of the base to be heated through friction at the contact surface with the actuating button 12. This ~~makes~~ can make it easier ~~to~~ for the neck 17 and the rib 18 to enter the blind-end bore 19 and for the plastic to flow into the annular space between the head 16, the neck 17, and the rib 18. After cooling, the actuating button 12 ~~is~~ can be solidly connected to the base 6. As FIG. 5 shows, the membrane in this embodiment has no bar-shaped ~~elevation~~projection around the base 6. Rather, the membrane includes ~~but~~ a recess 21 whose contour corresponds to the head 16 of the actuating button 12 and in which the head 16 sits with a precise fit after insertion of the button into the base 6.

In the embodiment of FIG. 5, both the head 16 of the actuating button 12 and the recess 21 in the membrane 9 have a cylindrical contour. Alternatively, as shown in FIG. 6, the recess 21 in the membrane 9, which adjoins the base 6 axially toward the outer side, can be conically constructed and can increase in diameter toward the outer side 11 at an angle α. The head 16 of

the actuating button 12 ~~is~~ can be shaped in a conical configuration. It decreases in diameter toward the neck 17 at an angle ß, which ~~is preferably~~can be larger than the angle α of the recess 21. Furthermore, the largest diameter D_2 of the head 16 is somewhat larger than the corresponding diameter D_1 of the recess 21. After the actuating button 12 is pressed in, the soft plastic of the membrane 9 in the vicinity of the head 16 is under tension, thus ~~preventing~~ helping to prevent the ingress of dirt into the recess 21.

~~Alternatively~~ As an alternative to the previously described embodiments, the neck 17 of the actuating button 12 can ~~also~~ be constructed with a smooth finish~~, i.e.~~ (e.g., free of projections). As FIG. 7 shows, the neck 17 sits with a precise fit in the blind-end bore 19 of the base 6 and is bonded thereto by an adhesive. The recess 21 in the membrane matches the head 16 of the actuating button 12.

In a further variant of the actuating button 12 shown in FIG. 8, its neck 17 supports an annular bead 22 instead of the previously described sharp-edge rib 18. In this variant the actuating button 12 ~~is~~ can be cast integrally with the base 6. The actuating button 12 ~~is~~ can be inserted in the injection mold such that hard plastic is molded around the neck 17 and the bead 22 when the housing body 2 is injection-molded. In the second molding step, the soft plastic membrane 9 ~~is~~ can then be molded on by the two-component injection method.

The actuating button 12 does not necessarily have a neck 17 adjoining the head 16. FIGS. 9 and 10 show an embodiment in which the actuating button 12 is comprised of only the head 16, with its underside constructed ~~preferably~~ to be flat. The base 6 is constructed to be somewhat raised in relation to the membrane 9, thus enabling the actuating button 12 to be joined to the base 6 by welding~~, for example~~ (e.g., by friction welding). ~~Here the~~The base 6 and the actuating button 12 ~~are preferably~~can be made from the same plastic or from ~~related~~compatible plastics, ~~with~~ and both parts ~~able~~ can be formed to have different colors. ~~If~~ In embodiments in which the actuating button 12 is made of ABS, a decorative metal layer can be applied by electroplating to the visible faces prior to welding. As a comparison of FIGS. 9 and 10 shows, the base 6 ~~is~~ can be slightly abraded during friction welding to the actuating button 12, resulting in the underside of the actuating button 12 resting flush on the upper side of the membrane 9 after the joining operation.

As FIG. 11 shows, the actuating button 12 can also be fastened to the base 6 by the two-component injection-molding method. In this case, the actuating button 12 is made of hard plastic~~, which preferably is at least related with the plastic of the base 6,~~ in order to obtain a firm bond in the injection-molding operation. In some embodiments, the plastic of the actuating button 12 is compatible with to (e.g., the same as) the plastic of the base 6. Through the separate molding-on of the actuating button 12, ~~it~~ the button 12 can be given a different color than the

housing body 2, thus achieving good recognition. The membrane 9 ~~is~~ can be molded on in a third injection-molding operation.

The embodiment of FIG. 12 shows an actuating button 12 which is formed by the base 6 itself. In this embodiment the actuating button 12 is produced as a continuation of the base 6 during the injection molding of the housing body 2. The membrane 9 is molded around the actuating button 12 in the second injection-molding operation. In this embodiment the housing body 2 and the actuating button 12 have the same color. However, recognition of the actuating button 12 can be very good when the membrane 9 has a different color. This version of the device ~~is characterized by being~~can be particularly ~~cheap~~ inexpensive to manufacture.

As FIGS. 13 and 14 show, it is ~~of course~~ possible to arrange two bases 6 in the aperture 4 of the housing body 2, thus enabling two actuating buttons to be fitted therein. As ~~the~~ a result, several function elements lying underneath the membrane can be actuated. It is also possible for a switch lying underneath to be switched on with the one actuating button and for the same switch to be switched off with the other actuating button. As FIGS. 13 and 14 show, the two bases 6 are each arranged on a separate bar 5, each of which extends from the wall 3 of the housing body 2 into the aperture 4. Independent actuation of the actuating buttons fastened to the two bases 6 is thus possible, regardless of the influence of the membrane 9.

According to another embodiment, ~~of the invention provision is made for~~ the base 6 ~~to be~~can be supported in the aperture 4 by two bars 5. As FIGS. 15 and 16 show, the two flat bars, which are arranged in a common plane parallel to the plane of the aperture 4, are shaped in an arcuate or undulating configuration in order to reduce (e.g., minimize) the bending resistance in a direction transverse to their plane. They extend to opposite lying edges of the aperture 4. After a membrane is molded around the bars 5 and the base 6, the base 6 can receive an actuating button in the way previously described.

An extensive membrane 9 may be ~~required~~ provided in the housing body 2 ~~in particular~~ for aesthetic reasons. ~~To fulfill this need, there~~There may, ~~is~~ however, be a risk of the membrane 9 becoming deformed and forming bulges or creases for example. To remedy this, a membrane support member 23 protruding parallel to the plane of the aperture 4 can be molded onto the bar 5 and/or the base 6. As FIG. 17 shows, a membrane support member 23 in the form of a thin plate can be fastened to the base 6 and the bar 5 with, the plate being arranged roughly concentric to the aperture 4. ~~According to the embodiment of~~As shown in FIG. 18, it is also possible to provide ~~plural~~ multiple membrane support members 23 in the form of fingers or wings which extend in the plane of the aperture 4 away from the base 6 and transverse ~~from~~ to the bar 5. After a membrane of soft plastic is molded around the bars 5, the base 6, and the membrane

support members 23, the base 6 can receive an actuating button in the manner previously described.

In the previously described embodiments the actuating button 12 including the head 16, the neck 17, and the rib 18 or bead 22 ~~are~~ were described as being constructed with a round cross section. However, it is also possible to provide a non-round cross section in order to anchor the actuating button 12 in the base 6 in a manner preventing relative rotation. In this arrangement a direction symbol such as an arrow can be provided on the actuating button 12 to indicate the pushing direction and/or the effect of actuating the actuating button 12.

In the previously described embodiments the wall 3 of the housing body 2 as well as the membrane 9 ~~are~~ were described as being of essentially flat construction. It will be understood, of course, that curved walls or membranes can ~~also~~ alternatively or additionally be provided ~~as an alternative~~.

Other embodiments are in the claims.

ABSTRACT ~~OF THE DISCLOSURE~~

~~Electrical Appliance Housing~~

~~The invention is directed to an~~An electrical appliance housing~~, with~~ including a hard plastic housing body ~~made from hard plastic, in which provision is made for an~~defining a switch-actuating aperture ~~to actuate a switch or the like in the interior of the housing body, . said~~ The aperture ~~being~~ is sealed ~~by means of~~with a soft plastic membrane ~~of soft plastic, . and further provision is made for an actuating button on or in the membrane for actuating the switch. According to the invention the~~ An actuating button is fastened to a hard plastic base ~~of hard plastics material~~ that is bonded to ~~the material of~~ the membrane. ~~The hard plastic base is hermetically connected to the membrane such that no water can reach the interior of the housing, with the plastics materials of the base and the membrane being preferably related with each other in order to ensure a firm bond. The actuating button can be made of various materials without having to give consideration to a suitable material pairing of the membrane and the actuating button with a view to obtaining a tight connection to the membrane. The membrane can be injection-molded onto the hard plastic base in a two-component injection-molding process. In a further aspect of the invention the base which supports the actuating button is connected by means of at least one elastic bar to the housing body. Preferably, the elastic bar is constructed to exhibit material homogeneity with the housing body and/or the base and is formed in one integral piece therewith.~~

~~(FIG. 4)~~